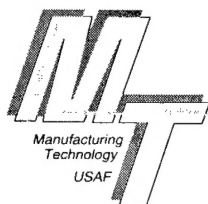


# PROGRAM STATUS REPORT

Wright Laboratory / Manufacturing Technology Directorate / Wright-Patterson AFB, Ohio  
Visit the ManTech Homepage at: <http://www.wl.wpafb.af.mil/mtx/index-n.html>

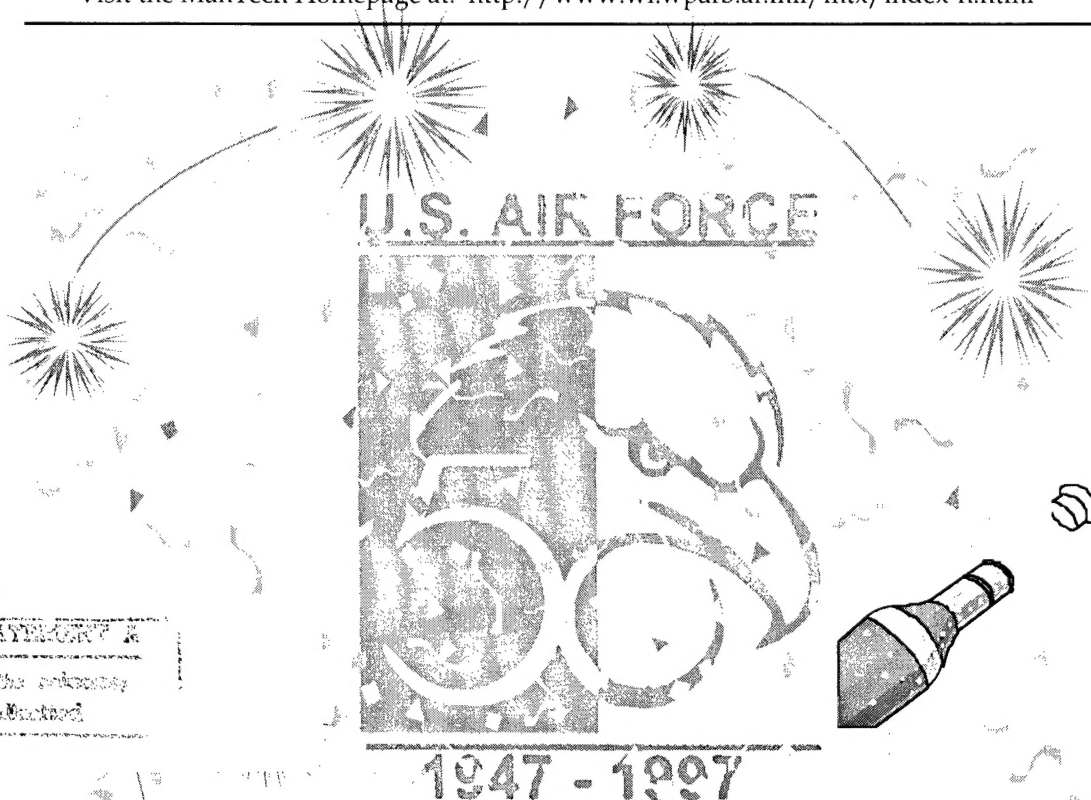


Fall 1997



**DISTRIBUTION STATEMENT A**

Approved for public release;  
Distribution Unlimited



September 18 marks the 50th anniversary of the Air Force, and celebrations are taking place all year long, all over the world, to commemorate the event.

#### In this issue:

Semiconductor Fabrication.....	2
MATCOPS.....	3
Military Products from Commercial Lines.....	4
Roadmap Review.....	6
MT Top Performers.....	7
Wright Laboratory Commander's Award.....	8
Lean Forum.....	9
General Purpose Noise Cancellation Processor.....	10
Defense Manufacturing Conference.....	11

19971008 095

# Project could save electronics industry billions

## *Earns 1996 R&D 100 Award*

A Wright Laboratory Manufacturing Technology Directorate-sponsored project has developed new instrumentation for in-line wafer-state diagnostics and process control for semiconductor fabrication which could result in significant savings when fully implemented.

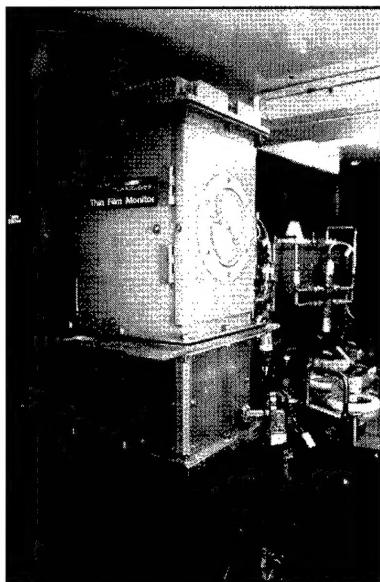
The significance of this achievement was recognized by R&D Magazine, when the instrument received the 1996 "R&D 100" award, for being one of the 100 most technologically significant new products developed over the year. This award has been given over the past 34 years to such breakthroughs as Polacolor film, the flashcube, the digital wristwatch, the liquid-crystal display, the fax machine, antilock brakes, the automated teller machine and the Nicoderm antismoking patch.

The new technology will improve yield, decrease reactor down-time, reduce the need for test-wafers, shrink process excursions, and tighten development cycles by implementing in-line and in-situ measurements with feedback control during device fabrication.

The primary goal of the semiconductor industry is to increase device density and lower per circuit cost, while increasing yield and throughput. The most direct method to achieve this goal is through real-time process monitoring and control. Reducing the time required for obtaining high yields for new semiconductor products is particularly attractive due to military requirements for high priority components in small quantities at low costs. Prior to this effort, only a few projects had been initiated dealing with in-line or in-situ sensing. These sensors, using ellipsometry, reflectometry, pyrometry, and emission spectroscopy provided limited data and had not been widely used. More versatile sensors and the control technology that uses the sensor data were needed to achieve the potential benefits of improved manufacturing.

MT's Program Manager for the project, Capt. Scott Montgomery, explained that Advanced Fuel Research (AFR) and On-Line Technologies, Inc. (On-Line) developed the new method under a Small Business Innovation Research (SBIR) Phase I effort. During the Phase II effort (scheduled for September 1997 completion), AFR and On-Line are developing the sensor for in-situ, in-line and at-line diagnostics of film thickness, composition, and temperature. With Applied Materials, Inc., AFR and On-Line have introduced an in-line epitaxial doping profile sensor for process monitoring that mounts directly on the cool-down chamber of the Applied Materials Centura single wafer cluster tool. Two of these systems have been sold for evaluation, and three more systems were ordered and delivered in the first quarter of 1997 for a Beta program. An at-line robotic wafer mapping tool, developed in Phase II with ADE Corporation assistance, has been introduced at Semicon West 1996. The new technology provides a 50-fold improvement in absolute accuracy in measuring epi film thickness.

(Captain Montgomery was recently reassigned. The new program manager for this project is P. Michael Price.)

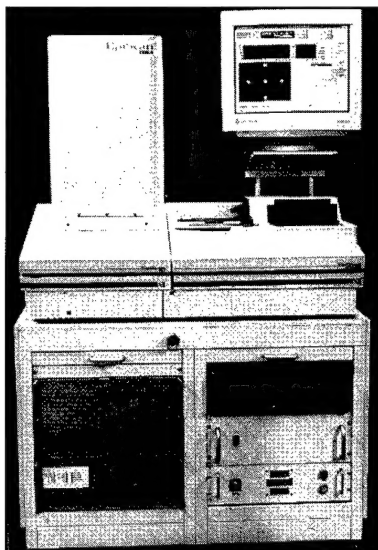


*In-line Sensor*

*Project Engineer:*  
**P. Michael Price**  
WL/MTMC  
(937) 255-2461

*Contract Number:*  
**F33615-95-C-5545**

For more  
information,  
circle  
Reader Response  
Number 1



*At-line Mapper*

# 

The Manufacture of Thermoplastic Composite Preferred Spares (MATCOPS) effort has successfully demonstrated a 25 percent reduction in design time to redesign an existing metal aircraft component to a composite part using an integrated design/manufacturing knowledge-based expert system.

Under a contract with the Wright Laboratory Manufacturing Technology Directorate, engineers from Northrop Grumman Corporation have developed an enhanced composite design capability for the redesign of existing aircraft components and transitioned this capability to the Air Logistic Centers (ALCs). This enhanced capability is the result of the development of an integrated design/manufacturing knowledge-based expert system, called the Integrated Product Manufacturing System (IPMS).

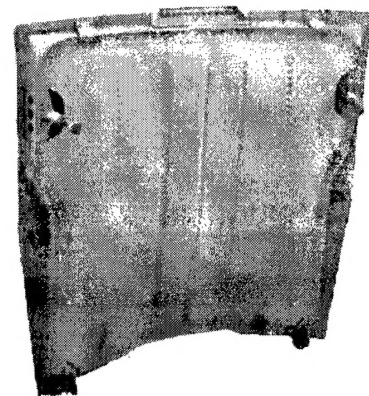
The IPMS is aimed at the designer, analyst, manufacturing engineer and tool designer. Its intended use is the re-design of existing secondary, non-flight-safety-critical metal aircraft structures to composites. The IPMS accepts as inputs part geometry, design constraints and production requirements. It automates some drafting and analysis functions, and uses a standard format to share loads, geometry, material properties and other information. These are used to develop part and tool designs, specifications, fabrication instructions and high level cost and schedule information.

Validation of the system was accomplished by using it to generate examples of part design and material/fabrication guidelines for airframe components. These were previously designed and manufactured on other programs, and will be modified in Phase III by using the IPMS to develop designs for the demonstration articles. Phase III of this effort will establish a repair and limited remanufacturing capability for the C-130 aft nose landing gear door at Warner Robins ALC, and for the C-135 nose wheel gear door at Oklahoma City ALC. A limited production run will be conducted at the ALCs to provide training for ALC personnel, establish valid cost projections, and validate the IPMS developed manufacturing and process guidelines.

The use of advanced composites in new weapon systems has dramatically increased. Advanced composites help achieve the desired goals of increased range, speed, payload, and supportability. The expanded application of composites into more of the airframe's structures introduces important rate production factors such as tool fabrication lead times and life, part reproducibility and integrity, tooling materials, etc., all of which are important considerations to overall manufacturing costs. In many cases, the component design, tool design and manufacturing process are far more costly than producing the parts themselves, especially when lot sizes are relatively small. This program focused on the use of computer-aided manufacturing technologies to develop and validate an integrated design/manufacturing system for non-critical structural components. This effort will permit the ALCs to efficiently redesign and develop composite secondary structure by providing an automated design and analysis capability. This will reduce the risk and span time for replacement of high maintenance items.



C-135 Landing Gear Door



C-130 Nose Landing Gear Door

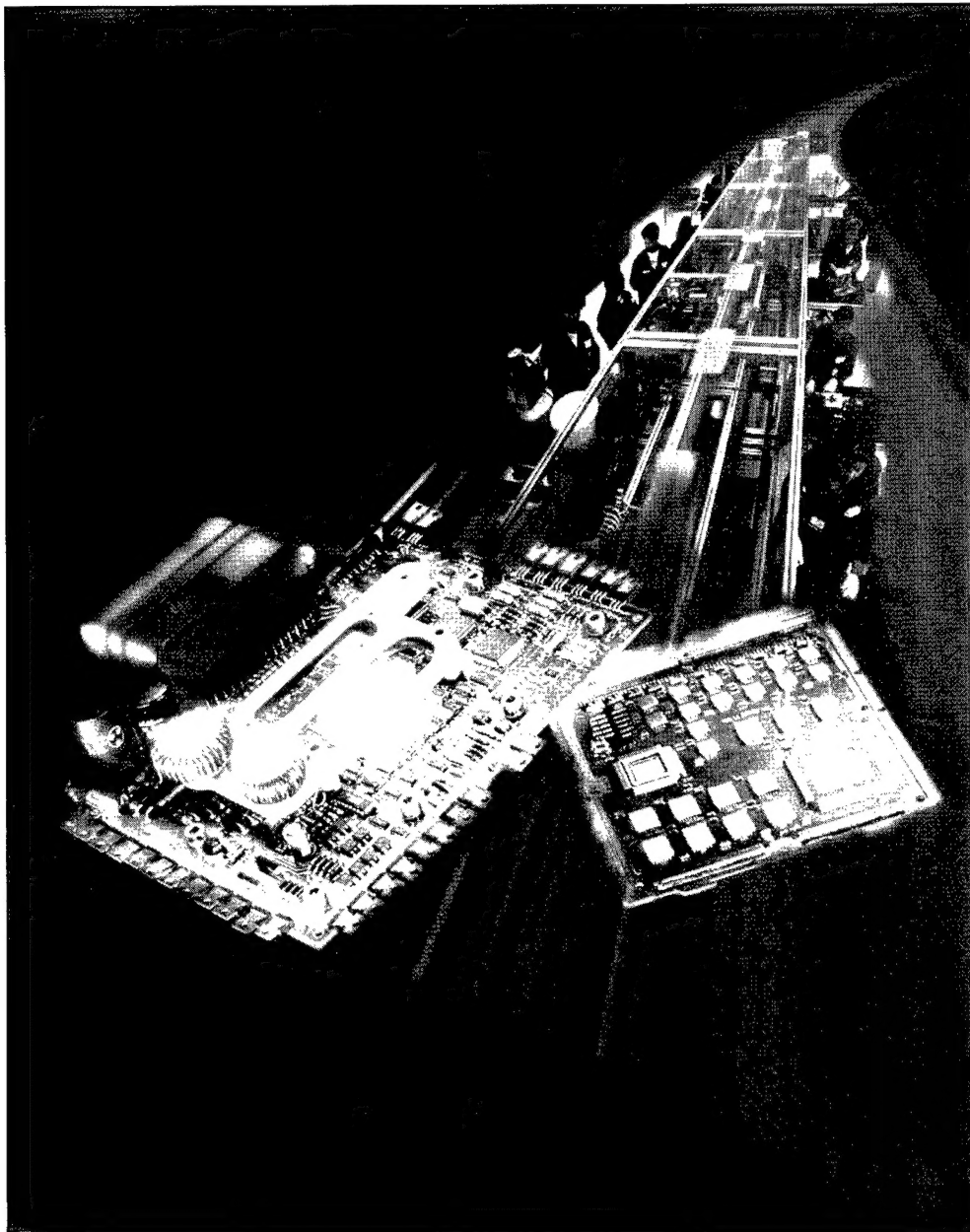
**Project Engineer:**  
**Diana Carlin**  
**WL/MTPN**  
**(937) 255-7277**

**Contract Number:**  
**F33615-91-C-5717**

For more  
information,  
circle  
Reader Response  
Number 2

## Producing Military Products from Commercial Lines reduces costs, overcomes barriers

The Military Products from Commercial Lines (MPCL) program, managed by the Wright Laboratory Manufacturing Technology Directorate, is demonstrating the commercial manufacture of military electronics modules. Two digital Communication, Navigation, Identification (CNI) modules compatible with the F-22 and Comanche systems have been redesigned for production on a commercial automotive electronics manufacturing line. The



*A typical commercial module (left) in comparison to an F-22 module (right).*

first modules were successfully assembled on the commercial line during design validation, and through the use of the commercial item definition and price analysis, the subcontract has been significantly streamlined to coincide with the supplier's commercial business practices.

The MPCL program focuses not only on process technology, but on the business practices and manufacturing infrastructure necessary to apply this approach across DoD programs and the industrial base. The MPCL team, consisting of Air Force, Army, and commercial and defense industry, is working together to demonstrate the feasibility and affordability of commercial-military integrated manufacturing.

To accomplish technical objectives, military designers have been working with commercial designers and manufacturers in a concurrent fashion to redesign the demonstration modules for commercial production. The program is also enhancing the capabilities of the commercial computer integrated manufacturing system to efficiently mix low volume and high volume processing. MPCL metrics have been defined in categories which reflect program objectives: price/profit optimization, technical performance, and technology transfer. The price of MPCL modules must reflect the target savings while providing reasonable profit for the commercial supplier. Technical performance must mirror military requirements in form, fit and function while exhibiting equal or better quality levels. And although the MPCL demonstration is key, success means enabling other current and future programs to realize similar benefits.

The MPCL is providing data and lessons learned to assist program offices in applying commercial processes to defense acquisition. Results have been significant in several areas, including contracting, teaming, requirements definition, design for manufacture, and commercialization. Through best practices in these areas, MPCL data shows a current savings of 54 percent and 73 percent for the two demonstration modules. With the potential to apply these practices to other modules, the benefits are significant for Air Force and Army systems.

Both the Air Force and the Army are immediate beneficiaries of this project, by producing military electronics modules on a commercial manufacturing line. This effort demonstrated that various business practice barriers can be overcome through innovative approaches to commercial item determination, price analysis, and non-government standards. By using this same approach with other avionics modules, there is significant cost savings potential across the Department of Defense.

The program is contracted to TRW Avionics Systems Divisions and subcontracted to TRW (North America) Automotive Electronics Group. The F-22 and Comanche customers are participating members of the MPCL team, along with their primes.

*Project Engineer:*  
**Mary Kinsella**  
**WL/MTMC**  
**(937) 255-5669**

*Contract Number:*  
**F33615-93-C-4335**

For more  
information,  
circle  
Reader Response  
Number 3



## Manufacturing Technology Directorate holds 1997 Roadmap Review

Leaders from industry, government and academia gathered at the Dayton Convention Center July 17, for the Wright Laboratory Manufacturing Technology (MT) 1997 Roadmap Review.

The event provided participants insight into planned Air Force manufacturing technology research and development activities. It also provided an opportunity for participants to offer suggestions and ideas on future MT research and development activities.

Dr. Charles E. Browning, MT director, told attendees about the directorate's vision to provide an affordable world-class manufacturing capability to meet the warfighters' needs throughout the defense system life cycle. He also provided attendees with an overview of the directorate's mission and research and development efforts.

Dr. Browning noted the directorate's many program accomplishments, highlighting the support given to MT's customers in the areas of new aircraft systems, aging systems, projected applications in aircraft, missiles and munitions, space, and repair, and in applications for the 21st century.

Dr. Browning also discussed integrated program strategy and guidance, while other speakers throughout the day addressed different MT interest areas, including Force Structure Requirements, Air Force needs for the 21st century and Industrial Base Requirements. The direction of future programs in Metals/Non-metals Processing and Fabrication, Electronics Processing and Fabrication, Manufacturing and Engineering Systems, and Advanced Industrial Practices, was also briefed. MT officials also provided requirements definitions in the areas of aircraft; missiles and munitions; space & C3I; and aerospace sustainment.

The Roadmap Review is the directorate's opportunity to get representatives from industry together to let them know about Air Force Manufacturing Technology interests. According to Dr. Browning, industry participation is key to the success of the directorate.

The directorate also presented awards to its top performers at a luncheon during the review.



*Deputy Assistant Secretary for Science, Technology and Engineering, Office of the Assistant Secretary of the Air Force for Acquisition, Dr. Helmut Hellwig, presents the R. Lee Kennard Heritage Award to Mary Kinsella.*

## MT Directorate recognizes top performers

The "top performer" award winners in the Wright Laboratory Manufacturing Technology Directorate were announced at the annual MT awards luncheon during the 1997 Roadmap Review, July 17, at the Dayton Convention Center.

Three awards are presented annually by the directorate: the R. Lee Kennard Heritage Award; the Support Award; and the Director's Award.

Winner of the R. Lee Kennard Heritage Award, which recognizes an engineer, industrial base specialist or manager displaying outstanding leadership and management qualities, is Mary Kinsella, of the Components and Processes Branch, Electronics Division. Kinsella was honored for taking an active role in leading the Military Products from Commercial Lines pilot program and was cited for her role in leadership of the Integrated Product Team (IPT) for this program, promoting close coordination of program performance, monitoring reviews and briefings to industry, and becoming directly involved with the F-22 System Program Office. Kinsella briefed then Secretary of Defense William Perry on this highly successful program, and continually receives praise from all levels for her management skills.

Other finalists nominated for this award include John Crabill, of the Industrial Practices Branch of the Advanced Industrial Practices Division, and the entire Supplier Focus Study Team. Team members included Mickey Hitchcock and Wally Patterson, of MTIM; Branch Boden, MTII; Bob Cross, MTMC; Ted Finnessy, MTX; Bob Reifenberg, MTAP; and Tim Swigart, MTPM.

Serving as management assistant for the directorate, Kristi Webb won the 1997 Support Award. Prior to her recent assignment to the Plans and Program Office, Webb was an active member of the Industrial Base Pilot (IBP) team. She was continually tasked to arrange and coordinate top level meetings which often included System Program Office Directors, the Wright Laboratory Commander, senior level officials from other defense organizations, and vice presidents of industry. She was cited for her outstanding initiative, selflessness and team spirit in support of the deputy director, technical director, the IBP IPT, and the Joint Defense Manufacturing Technology Panel Advanced Industrial Practices Subpanel.

Other finalists nominated for this award include Lt Jennifer Corneille, of MTX, and Tim Jones, a member of the Materials Directorate Procurement Team which supports MT.

The Director's Award was presented to the Manufacturing Technology Branch of the Wright Laboratory R&D Contracting Directorate, for their exceptional performance in contributing to the MT mission. The branch was cited for enhancing MT's capability by reducing contract award lead times, establishing creative solutions to tough issues, and fostering a "can-do" attitude between the technical and acquisition staffs.

Branch members include: John Brady, Tim Jones, Bruce Miller, Chris Lay, Sue Palmer, Lori Shirdon, Jane Dillon, Patty Nickell, William Underwood, Rita Hawkins, Javana Spearman, Bill Beeman, Tara Willis, Jim Garrard, and Kenneth Wright.



*Kristi Webb receives her Support Award from Deputy Director of Wright Laboratory, Dr. Vince Russo.*



*John Brady accepts the MT Directors Award from Dr. Charles Browning.*

## Industrial Base Pilot Integrated Process Team earns WL Commander's Team Award

The Manufacturing Technology Directorate (MT) walked away with the Wright Laboratory (WL) Commander's Team Award, during a ceremony held June 24, in the Air Force Institute of Technology auditorium.

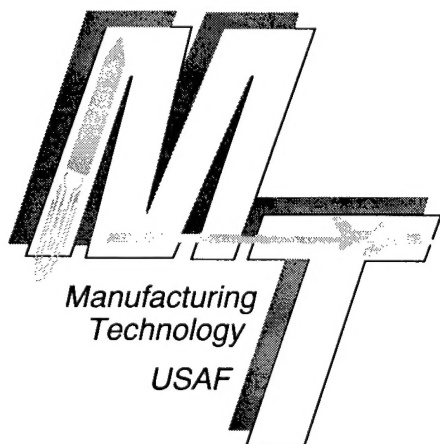
WL Commander's Awards are given at the discretion of the WL Commander and Deputy Director, upon recommendation by a selection committee. These two awards (individual and team) are the most prestigious in WL, second only to WL Fellows Awards. The Commander's Team Award recognizes a team that has demonstrated outstanding effectiveness and quality as a working group.

The MT Industrial Base Pilot Integrated Process Team received this award for pioneering a new way of doing business between WL, industry, and System Program Offices (SPOs). The team has been on the leading edge of acquisition reform, blazing new trails into business policies and practices and manufacturing infrastructure areas, while pursuing an overall goal of weapon system affordability.

Supporting the WL affordability mission, the IBP team is identifying the world's best commercial and military practices which can be used to manufacture affordable weapon systems to meet the warfighters' needs. The team has total responsibility for the success of three pilot programs with a face value of \$93.5 million. Through these pilots, significant inroads were made into the Air Force F-22 and C-17 SPOs and the Army RAH-66 Program Management Office, with documented cost savings of 30 to 50 percent on major component parts.

The IBP IPT is pursuing technology that will provide real benefits to the user and foster long-term change within the Air Force, the industrial base, and the Department of Defense (DoD). They are breaking down traditional technical and business barriers (real and perceived) imposed by specification, by law, and by regulation, to open the doors to the commercial supplier base. The team has reached out beyond normal boundaries to change the way Wright Laboratory, the Air Force, and potentially, all of DoD, does business.

Team members include: Brench Boden, Kristi Webb, Ken Ronald, Mary Kinsella, Tracy Houpt, Jane Dillon, Richard Anderson, Laura Terrian, Michael Heberling, and Robert Anderl.





## MT-led team organizes Lean Forum IV to identify opportunities, implement lean practices

Lean concepts present the US military aircraft industry with an opportunity to meet the challenges of reductions in DoD procurements and increased global competition. The adoption of lean principles and practices allows the industry to meet customer requirements for affordability without sacrificing performance. Through these efforts, the industry's position as the world's leading producer of advanced technology aircraft systems will be strengthened.

The drive towards "lean" began with the Lean Aircraft Initiative. The LAI had its genesis in the five-year International Motor Vehicle Program conducted by a Massachusetts Institute of Technology (MIT) research team as described in the book, "The Machine that Changed the World." The objective of the Lean Aircraft Initiative is to develop a framework for implementation of fundamentally different, provable methods of manufacturing, enterprise-wide. These methods would then better support defense aircraft needs over the next 30 years. The Lean Aircraft Initiative is funded through a cooperative agreement between the government and MIT. Using separate contracting vehicles with MIT, the aerospace industry provides MIT's share of the cooperative agreement with funding from each of the 19 member companies.

LAI research findings are documented primarily through the Lean Enterprise Model (LEM), where results are organized to populate the LEM with data on lean practices, metrics, benchmarking information, interactions, key benefits, major barriers, and mitigation strategies. Lean forums are then conducted to transition research findings to the customer base and establish requirements for both technology and acquisition investment planning processes.

Lean forums are joint industry-government-academia meetings designed to identify opportunities for implementing lean practices. They seek to accomplish this by reviewing MIT and government research and findings, and industry recommendations, addressing issues and risks of lean implementation, and establishing a consensus on what approaches to take, and where to place priorities. The goal is to achieve affordability in lean enterprises and lean acquisitions by adopting best practices and implementing lean findings.

The Wright Laboratory Manufacturing Technology Directorate's Lean Forum Integrated Process Team was formed to organize Lean Forum IV. This IPT met with government, academia, and industry representatives in Denver, at the Loew's Giorgio Hotel September 9-10. Three other lean forums, starting with Lean Forum I in August 1994, resulted in ten programs, including one for the C-17, four for the Joint Strike Fighter, and two Industrial Base Pilots.

This fourth lean forum meeting, led by the IPT, involved all government stakeholders in the process up front, to translate previous research into potential funded projects. Emphasis was placed on defining Pilot projects, rather than Pathfinder projects. Pathfinders are short duration (12-18 months) demonstration-oriented projects aimed at "proving out" a specific business change or tool. Industrial Base Pilots are 2-3 year efforts that implement results of demonstrations which simultaneously validate changes in business practice and manufacturing infrastructure, while addressing a specific manufacturing technology effort that benefits a system program office. Pilots must be timely to impact a window of opportunity, yet not be on the critical path of an acquisition program.

Pilots have a positive impact on programs in terms of cost, time, risk or capability. They also positively impact industrial base trends, or efforts to manage change. The results and processes then migrate throughout the government and industry.

*Project Engineer:*

**Pat Price**

**WL/MTII**

**(937) 255-7371**

For more  
information,  
circle  
Reader Response  
Number 4

## General Purpose Noise Cancellation Processor develops affordable noise vibration control

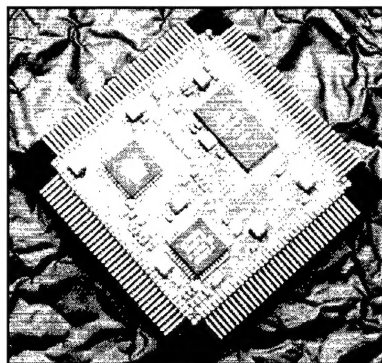
*Project Engineer:*  
**Deborah Kennedy**  
WL/MTPM  
(937) 255-3612

*Contract Number:*  
**F33615-94-C-4403**

The General Purpose Noise Cancellation Processor project developed "QuietChip," a miniaturized electronic computer specialized to support active reduction of noise and vibration. Only two inches square, QuietChip costs about \$350 to produce, but it replaces computers 100 times larger and costing 50 times as much. This technology makes it feasible to use active noise and vibration control (ANVC) systems in aircraft, automobiles, and ships.

QuietChip will provide much cheaper, smaller, and more reliable electronics packages for ANVC systems. Such systems are now used by the Navy to reduce ship radiated noise and ship-interior noise. Increasing use of ANVC is expected for reducing helicopter noise and vibration, as well as to quiet tanks and trucks.

Under a Defense Advanced Research Projects Agency (DARPA) funded contract, sponsored by the Manufacturing Technology Directorate, engineers from BBN Inc., developed an electronic controller designed to perform the control functions in generalized active noise and vibration control systems. The new part, called QuietChip, was miniaturized by fabricating it as a multi-chip module (MCM). This MCM technology was developed during the early 1990's at several companies, often with DARPA support. QuietChip is an MCM with analog inputs and outputs, but with digital processing. Each one accepts up to 20 analog inputs from vibration and noise sensors, and delivers up to four analog outputs to vibration actuators or sound loudspeakers. Control filtering is done with a 40 MFlop, 32-bit digital signal processor chip, served by appropriate memory and buffers. It consists of a nine-layer substrate with 13 IC die on one side, and a number of surface mount parts on the other, and its small size enables very low input to output time delay for digital signal processing. This feature gives QuietChip the potential for use in almost any broad bandwidth system control application and makes it a suitable test component for the MCM foundry at Motorola. Up to twelve MCMs can be paralleled on the same data bus to expand the ANVC system size. The MCM part was designed with computer assisted design/computer assisted manufacturing (CAD/CAM) tools by engineers at BBN and at the Motorola MCM foundry in Phoenix. All design and manufacturing files were transferred electronically, and the completed MCMs were debugged over the internet via modems. Six MCMs were used in a parallel computing architecture to demonstrate successfully an ANVC system that reduced road and engine noise in an automobile supplied by General Motors.



*QuietChip*

Since large control-computer cost and size have been the principal barriers to use of ANVC in commercial applications, QuietChip may be a leading factor for the inauguration of ANVC as a significant new business segment. ANVC systems offer potential benefits in automotive, aircraft, and marine applications, because the low-frequency components of noise can be reduced with less weight and size than are needed by present noise control systems. The size and weight savings can have very large payoffs in fuel economy and structural complexity. ANVC systems are computationally very complex, often requiring more than one GFlop of 32-bit processing with 10 microsecond, or less, latency. The cost and size of this kind of computer system is so high that ANVC systems are mostly only used in high-value military applications. The General Purpose Noise Cancellation Processor project was undertaken to create a much smaller and cheaper computer system that would meet the requirements of most ANVC systems. QuietChip is the first hybrid, 40 MFlop computer built as an MCM, and it should lead the way for a new generation of real time processors used as system controllers.

For more  
information,  
circle  
Reader Response  
Number 5

# DMC 97

## Joint Defense ManTech Panel

### "Building Partnerships for the 21st Century"

1-4 December 1997  
Monday - Thursday

Palm Springs, California

DoD ManTech Website: <http://mantech.iitri.com/>

TUESDAY, 2 DECEMBER 1997

**Keynotes** - Honorable R. Noel Longuemare, DoD  
- Gen. George Babbitt, USAF  
- Industry (TBD)

**Panel - 21st Century Partnerships**

- Mr. John Phillips, DoD  
- Mr. Art Money, USAF  
- Dr. Kenneth Oscar, USA\*  
- Mr. John Douglas, USN\*

WEDNESDAY, 3 DECEMBER 1997

**Panel - Acquisition Reform**

- Ms. Donna S. Richbourg, DoD  
- Ms. Darleen Druyun, USAF  
- Mr. Gary Tull, USA  
- Mr. Dan Porter, USN  
- Mr. Peter De Mayo, Lockheed-Martin

**Speakers** - Dr. Michael F. McGrath, DoD  
- Dr. Lance Davis, DoD

- Mr. James Sinnett, McDonnell Douglas

THURSDAY, 4 DECEMBER 1997

**Panel - Senior Statesman**

- Gen. Ronald Yates (Ret)  
- Gen. Robert Marsh (Ret)  
- Gen. Leon Salomon (Ret)  
- Adm. William Bowes (Ret)

**Panel - LCC Reduction**

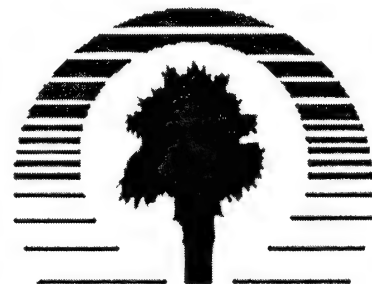
- Lt. Gen. Ronald T. Kadish, USAF

\*INVITED



LODGING:

WYNDHAM PALM SPRINGS HOTEL AND THE  
PALM SPRINGS HILTON HOTEL



Palm Springs  
Convention Center

EXHIBIT MANAGER: Tracy Tapia, UTC  
PHONE: (937) 426-2808 EMAIL: [tapia@erinet.com](mailto:tapia@erinet.com)

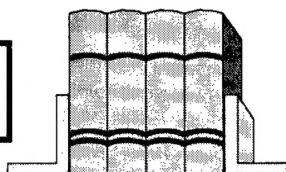
# 12 *END OF CONTRACT FORECAST*

DATE	PROJECT TITLE CONTRACT NO.	PRIME CONTRACTOR	POINT OF CONTACT
September 1997	Self Orienting Fluidic Transport (SOFT) Assembly F33615-96-C-5111	Beckman Display Incorporated Berkley, CA	Charles Wagner (937) 255-2461
September 1997	Strategic Packaging for Single & Multi-Chip Modules Using Very Small Peripheral Arrays F33615-96-2-5110	Panda Project Boca Raton, FL	Charles Wagner (937) 255-2461
September 1997	Tertiary Recycling of Electronic Materials F33615-95-C-5507	Adherent Technologies Incorporated Albuquerque, NM	Ronald Bing (937) 255-2461
September 1997	Fluxless, No Clean, Solder Processing of Components Printed Wiring Board F33615-95-2-5511	MCNC, Electronic Technologies Division Research Triangle Park, NC	Ronald Bing (937) 255-2461
September 1997	Manufacturing Technology for Multifunctional Radomes F33615-93-C-4312	Lockheed Martin Corporation Palmdale, CA	Diana Carlin (937) 255-7277
September 1997	Cell for Integrated Manufacturing Protocols, Architectures and Logistics (CIMPAL) F33615-90-C-5003	Central State University Wilberforce, OH	David See (937) 255-3612
October 1997	Rapid Laser Shock Peening Development (Rapid Overlay System) F33615-97-C-5137	LSP Technologies Dublin, OH	Timothy Swigart (937) 255-3612
October 1997	Acoustic Wave Inspection of Silicon-on-Insulator (SOI) Wafers F33615-97-C-5135	IBIS Technology Corporation Danvers, MA	Walt Spaulding (937) 255-2461
October 1997	Supply Chain Integrated Product/Process Development (IPPD) Pilot Project AMII F33615-96-2-5602	Automotive Industry Action Group Southfield, MI	George Orzel (937) 656-9219
October 1997	Integrated Product & Process Development (IPPD) Tools F33615-96-C-5605	Dayton Aerospace Associates Incorporated Dayton, OH	George Orzel (937) 656-9219
October 1997	Open Architecture Machine Tool Controllers F33733-95-C-1088	OASYS Group Incorporated Naperville, IL	Eric Pohlenz (937) 255-3701
November 1997	Method of Producing Advanced Printed Wiring Boards Using the Technology of Thermal Spraying F33615-97-C-5131	Thermal Spray Technologies Incorporated Sun Prairie, WI	Jennifer Corneille (937) 255-4623
November 1997	Integrated Product/Process Development (IPPD) Simulation Model F33615-97-C-5129	Decision Dynamics Incorporated Silver Spring, MD	Cliff Stogdill (937) 656-9222
November 1997	Process & Prototype Tool for Re-Engineering Test Requirements from Legacy Data & Hardware F33615-97-C-5132	Intermetrics Incorporated McLean, VA	Bill Russell (937) 255-7371
November 1997	Systems Engineering Using Key Characteristics F33615-97-C-5138	Schwalb Consulting Irvine, CA	George Orzel (937) 656-9219

DATE	PROJECT TITLE CONTRACT NO.	PRIME CONTRACTOR	POINT OF CONTACT
November 1997	Conformable Multichip Assembly Technology F33615-97-C-5128	Epic Technologies Incorporated Woburn, MA	Charles Wagner (937) 255-2461
November 1997	Moisture Detection in Honeycombs via Advanced Radioscopy F33615-91-C-5623	Lockheed Martin Corporation Palo Alto, CA	Deborah Kennedy (937) 255-3612
November 1997	Mobile Automated Scanner (MAUS) F33615-91-C-5664	McDonnell Douglas Corporation St Louis, MO	Deborah Kennedy (937) 255-3612
November 1997	Airborne Warning & Control System (AWACS) Salvageable Electron Gun F33615-96-C-5103	Litton Corporation San Carlos, CA	P Michael Price (937) 255-2461
November 1997	Activity-Based Costing for Agile Manufacturing Control F33615-95-C-5516	Industrial Technology Institute Ann Arbor, MI	Cliff Stogdill (937) 656-9222
November 1997	Practice-Oriented Masters Engineering Program F33615-94-1-4422	Ohio State University Columbus, OH	Theodore Finnessy (937) 255-4623
November 1997	Minnesota Consortium for Defense Conversion F33615-94-2-4417	Minnesota Technology Incorporated Minneapolis, MN	Cliff Stogdill (937) 656-9222
December 1997	Definition of Generic Production Cost Model F33615-97-C-5127	Wallace & Company Greensboro, NC	Wallace Patterson (937) 656-9220
December 1997	Microwave Curing for Reversible Bonding of Composites F33615-97-C-5139	Aerotech Incorporated Pittsburgh, PA	Vincent Johnson (937) 255-7277
December 1997	Whole Wafer Thermal Measurement by Means of Laser Ultrasound F33615-97-C-5133	Karta Technology Incorporated San Antonio, TX	Ronald Bing (937) 255-2461
December 1997	Real-Time Whole Wafer Thermal Imaging for Semiconductor F33615-97-C-5134	On-Line Technologies Incorporated East Hartford, CT	Ronald Bing (937) 255-2461
December 1997	Flexible Laser Automated Intelligent Research System for Manufacturing and Fabrication F33615-95-C-5503	American Welding Society Miami, FL	Rafael Reed (937) 255-2413
December 1997	Development of a Low Cost Environmentally Benign All-Sputtered Fabrication of Thin Film Transistors (TFTs) for Active Matrix Liquid Crystal Displays (AMLCD) F33615-94-C-4446	Intevac Incorporated Santa Clara, CA	Charles Wagner (937) 255-2461
December 1997	Low Cost Electrode Fabrication Process for High Definition System (HDS) Color Flat Panel Displays (FPDs) F33615-94-C-4411	Photonics Imaging Northwood, OH	Charles Wagner (937) 255-2461
December 1997	Improved Emissive Coatings for Super High Efficiency Color AC-PDPs F33615-94-C-4408	Photonics Imaging Northwood, OH	Charles Wagner (937) 255-2461
December 1997	Precision Thick Film Technology for 100% Yield Photonics Imaging of Large Area High Resolution Color AC-PDPs F33615-94-C-4406	Photonics Imaging Northwood, OH	Charles Wagner (937) 255-2461



## Reports



### **Alternative Process for Environmentally Safe Cleaning of Aircraft Honeycomb**

Alog Number: 3864  
Contract Number: F42600-90-D-1140  
Technical Report Number: WL-TR-96-8021  
Distribution: LIMITED

---

### **Composite Overwrapped Pressure Vessels (COPV)**

Alog Number: 3865  
Contract Number: F33615-93-C-5308  
Technical Report Number: WL-TR-96-8007  
Distribution: LIMITED

---

### **Agile Manufacturing Supply Chain**

Alog Number: 3866  
Contract Number: F33615-92-D-5812  
Technical Report Number: WL-TR-024  
Distribution: UNLIMITED

---

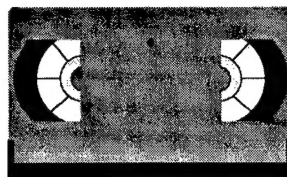
### **RF Seeker Cost Reduction Initiative**

Alog Number: 3869  
Contract Number: F33615-92-D-5812  
Technical Report Number: WL-MT-027  
Distribution: LIMITED

---

### **Design and Manufacture of Low Cost Composites (DMLCC), Wing**

Alog Numbers: 3870  
Contract Number: F33615-91-C-5720  
Technical Report Number: MDA B2447-16  
Distribution: LIMITED



## Videos

### **MT Task II VHSIC PWB Fabrication**

Alog Number: 86  
Length: 13:10  
Distribution: LIMITED

---

### **MT Task III Solder Process Controls**

Alog Number: 87  
Length: 7:15  
Distribution: LIMITED

---

### **MT Task IV/V Integration & System Demonstration**

Alog Number: 88  
Length: 13:00  
Distribution: LIMITED

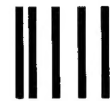
## Ordering

Wright-Patterson personnel or their contractors may contact the Wright Laboratory (WL) Technical Library, (937) 255-7415. They must be registered with the library in order to obtain reports. Classified or limited documents will be released only to the contract monitor.

Non-Wright-Patterson personnel who wish to obtain any WL documents, and are registered with the Defense Technical Information Center, should contact the center. To register call 1-800-CAL-DTIC.

To obtain unlimited/unclassified documents, contact the National Technical Information Service, (703) 487-4650.

For further information, or to order videos, call the Technology Transfer Center at (937) 256-0194, or visit our www site at: [http://www.wl.wpafb.af.mil/mtx/html/programs/ttc/ttc\\_lib.htm](http://www.wl.wpafb.af.mil/mtx/html/programs/ttc/ttc_lib.htm)

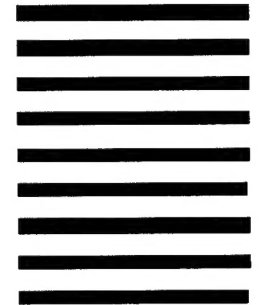


**NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES**

# **BUSINESS REPLY MAIL**

**FIRST CLASS MAIL PERMIT NO. 1006 DAYTON, OH**

**POSTAGE WILL BE PAID BY ADDRESSEE**



**ManTech Technology Transfer Center  
WL/MTX Building 653  
2977 P Street, Suite 6  
WPAFB OH 45433-9905**



(To mail, remove this page. Fold in half on dotted line, this side facing out. Seal open end with piece of tape at top — DO NOT STAPLE! No postage necessary.)

## **READER REPLY MAIL**

- ☐ I am on the Program Status Report mailing list.  
Please update my address.
- ☐ Add me to the Manufacturing Technology  
Program Status Report mailing list.
- ☐ Remove me from the Manufacturing Technology  
Program Status Report mailing list.

For more information, circle the appropriate  
reader response number:

**1 2 3 4 5**

**Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Please attach current business card  
or print legibly.**

**Name** \_\_\_\_\_

**Company** \_\_\_\_\_

**Address** \_\_\_\_\_

**City** \_\_\_\_\_

**State** \_\_\_\_\_ **Zip** \_\_\_\_\_

**Email Address** \_\_\_\_\_

**Fall 1997**



The USAF Manufacturing Technology

# PROGRAM STATUS REPORT

Fall 1997

## APPROVED FOR PUBLIC RELEASE

The Manufacturing Technology (MT) Program Status Report is designed to inform you of significant accomplishments, forthcoming events of widespread interest, and to expedite direct exchanges between government and industry management concerned with broadbased MT activities. Recipients are encouraged to route the Status Report to associates and other organizational functions engaged in MT program activities. All comments relating to this Status Report should be directed to WL/MTX (Program Status Report), Building 653, 2977 P Street, Suite 6, Wright-Patterson AFB OH 45433-7739. Telephone: (937) 256-0194. Approved for public release (ASC/PA#97-2080)

## FOREIGN DISSEMINATION

Details regarding many specific MT programs are subject to special export controls. Therefore, follow-up from any foreign sources should be processed through embassy channels following normal procedures for request of technical information or technology transfer.

---

Fall 1997

**ManTech Technology Transfer Center**  
**WL/MTX Building 653**  
**2977 P Street, Suite 6**  
**WPAFB OH 45433-7739**

**Official Business**

